

App. No. 10/501,291
Office Action Dated March 24, 2008

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IN THE CLAIMS

Amendments to the claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of measuring an amount of a glycated protein as an analyte in a sample, comprising:

~~causing adding a fructosyl amino acid oxidase for degradation (degradation FAOD) to the sample as a pretreatment to act on a glycated amino acid present in the sample so that the analyte remains in the sample and the a glycated amino acid as a contaminant present in the sample is degraded and is removed from the sample by the degradation FAOD and the analyte remains in the sample;~~

~~degrading the analyte with adding a protease to the sample to give a degradation product of the analyte remaining in the sample either before or after causing the fructosyl amino acid oxidase to act on the glycated amino acid; then~~

~~causing adding a fructosyl amino acid oxidase for measurement (measurement FAOD) to the sample treated with the protease to act on a proteolytic degradation product of the analyte to cause a redox reaction between the measurement FAOD and the degradation product of the analyte in the presence of a tetrazolium compound and sodium azide; and~~

~~measuring an amount of hydrogen peroxide generated by the redox reaction to determine the amount of the analyte,~~

~~wherein the redox reaction is conducted in the presence of a tetrazolium compound and sodium azide.~~

~~wherein the measurement FAOD is added after the adding of the protease to the sample.~~

~~wherein the measurement of the amount of hydrogen peroxide comprises~~

~~adding a color-developing substrate to allow a redox reaction between the color-developing substrate and the hydrogen peroxide, and~~

~~measuring an amount of color developed by the color-developing substrate to determine the amount of the hydrogen peroxide.~~

App. No. 10/501,291
Office Action Dated March 24, 2008

2. (Original) The method according to claim 1, wherein the glycated protein is glycated hemoglobin.
3. (Canceled)
4. (Previously presented) The method according to claim 1, wherein the measurement of the amount of hydrogen peroxide further comprises
adding N-(carboxymethylaminocarbonyl)-4,4'-bis(dimethylamino) diphenylamine sodium salt as the color-developing substrate to a reaction solution of the redox reaction in the presence of a surfactant; and
a concentration of the tetrazolium compound in the reaction solution is in a range from 0.5 to 8 mmol/l, a concentration of the sodium azide in the reaction solution is in a range from 0.08 to 0.8 mmol/l, a concentration of the surfactant in the reaction solution is in a range from 0.3 to 10 mmol/l, and a pH of the reaction solution is in a range from 7.0 to 8.5.
5. (Original) The method according to claim 1, wherein the fructosyl amino acid oxidase caused to act on the glycated amino acid is specific for a glycated α -amino group, and the fructosyl amino acid oxidase caused to act on the glycated protein is specific for a glycated α -amino group and a glycated side chain of an amino acid residue.
6. (Currently Amended) The method according to claim 1, wherein a solution containing the tetrazolium compound and the sodium azide is aged by leaving the solution to stand at a temperature in the range from 20°C to 60°C for 6 to 120 hours and is then added to the sample at least before the adding of the measurement FAOD.
7. (Original) The method according to claim 1, wherein the tetrazolium compound is 2-(4-iodophenyl)-3-(2,4-dinitrophenyl)-5-(2,4-disulfophenyl)-2H-tetrazolium salt.
8. (Original) A method of determining a ratio of glycated hemoglobin to hemoglobin, comprising:

App. No. 10/501,291
Office Action Dated March 24, 2008

measuring an amount of glycated hemoglobin in a sample by the method according to claim 1;

measuring an amount of hemoglobin in the sample; and

calculating the ratio of the glycated hemoglobin to the hemoglobin using the amount of the glycated hemoglobin and the amount of the hemoglobin thus measured.

9. (Currently Amended) A measuring kit used for measuring a glycated protein using a redox reaction, comprising:

a pretreatment reagent for pretreating a sample, containing a first fructosyl amino acid oxidase;

a protease reagent containing a protease; and

a color-developing reagent containing a second fructosyl amino acid oxidase, an oxidoreductase, and a color-developing substrate,

wherein the first fructosyl amino acid oxidase is present in an amount suitable for a degradation of a glycated amino acid as a contaminant present in the sample, and

the second fructosyl amino acid oxidase is present in an amount suitable for a redox reaction with a degradation product of the analyte degraded by the protease.

10. (Original) The measuring kit according to claim 9, wherein the glycated protein is glycated hemoglobin.

11. (Previously presented) The measuring kit according to claim 9, wherein the first fructosyl amino acid oxidase contained in the pretreatment reagent is specific for a glycated α -amino group, and the second fructosyl amino acid oxidase contained in the color-developing reagent is specific for a glycated α -amino group and a glycated side chain of an amino acid residue.

12. (Canceled)

13. (Currently Amended) The measuring kit according to claim 42 9, wherein the protease is at least one protease selected from the group consisting of metalloproteinases, bromelain,

App. No. 10/501,291
Office Action Dated March 24, 2008

papain, trypsin, proteinase K, subtilisin, and aminopeptidase.

14. (Currently Amended) The measuring kit according to claim ~~12~~ 9, wherein the protease is at least one protease that degrades glycosylated hemoglobin selectively and is selected from the group consisting of metalloproteinases, bromelain, papain, trypsin derived from porcine pancreas, and protease derived from *Bacillus subtilis*.

15. (Currently Amended) The measuring kit according to claim ~~12~~ 9, wherein the protease reagent further contains a tetrazolium compound and sodium azide.

16. (Original) The measuring kit according to claim 15, wherein, in the protease reagent, the tetrazolium compound (A) and the sodium azide (B) are present at a ratio (molar ratio A : B) in a range from 20 : 3 to 20 : 12.

17. (Currently Amended) The measuring kit according to claim ~~12~~ 9, wherein the protease reagent contains a metalloproteinase as the protease and further contains Ca and Na, and a concentration of the metalloproteinase is in a range from 100 to 40,000 KU/l, a concentration of Ca is in a range from 0.1 to 50 mmol/l, and a concentration of Na is in a range from 5 to 1000 mmol/l.

18. (Original) The measuring kit according to claim 9, wherein the color-developing substrate is N-(carboxymethylaminocarbonyl)-4,4'-bis(dimethylamino) diphenylamine sodium salt.

19. (Original) The measuring kit according to claim 9, wherein at least one of the pretreatment reagent and the color-developing reagent further contains a surfactant.

20. (Currently Amended) The measuring kit according to claim ~~12~~ 9, wherein the protease reagent further contains a surfactant.

App. No. 10/501,291

Office Action Dated March 24, 2008

21. (Previously presented) The measuring kit according to claim 19, wherein the surfactant is at least one surfactant selected from the group consisting of polyoxyethylene ethers, polyoxyethylene phenol ethers, polyoxyethylene sorbitan alkyl esters, and polyoxyethylene alkyl ethers.
22. (Original) The measuring kit according to claim 9, wherein the pretreatment reagent further contains at least one buffer selected from the group consisting of CHES, MOPS, TAPS, EPPS, phosphate, HEPPSO, POPSO, and borate, and a pH of the pretreatment reagent is in a range from 8.0 to 10.0.
23. (Original) The measuring kit according to claim 9, wherein the color-developing reagent further contains at least one buffer selected from the group consisting of MES, Tris, phosphate, MOPS, TES, HEPES, HEPPSO, and EPPS, and a pH of the color-developing reagent is in a range from 6.0 to 9.0.
24. (Currently Amended) The measuring kit according to claim ~~12~~ 9, wherein the protease reagent further contains at least one buffer selected from the group consisting of Tris, MES, DIPSO, TES, POPSO, HEPES, MOPSO, Bis-Tris, MOPS, ADA, PIPES, ACES, and phosphate, and a pH of the protease reagent is in a range from 5.0 to 7.0.
25. (Original) The measuring kit according to claim 15, wherein the tetrazolium compound is 2-(4-iodophenyl)-3-(2,4-dinitrophenyl)-5-(2,4-disulfophenyl)-2H-tetrazolium salt.
26. (Original) The measuring kit according to claim 9, wherein the pretreatment reagent further contains at least one of uricase and bilirubin oxidase.
27. (Original) The measuring kit according to claim 9, wherein the color-developing reagent further contains sodium azide.
28. (Previously presented) The measuring kit according to claim 22, wherein the first fructosyl amino acid oxidase in the pretreatment reagent is specific for a

App. No. 10/501,291
Office Action Dated March 24, 2008

glycated α -amino group;

in the pretreatment reagent, a concentration of the first fructosyl amino acid oxidase is in a range from 10 to 5000 U/l and a concentration of the buffer is in a range from 5 to 200 mmol/l; and

a pH of the pretreatment reagent is in a range from 8.0 to 10.0.

29. (Previously presented) The measuring kit according to claim 15, wherein

the protease reagent further contains Ca, Na, and a buffer;

the protease in the protease reagent is a metalloproteinase;

in the protease reagent, a concentration of the metalloproteinase is in a range from 100 to 10,000 KU/l, a concentration of the tetrazolium compound is in a range from 0.1 to 10 mmol/l, a concentration of the sodium azide is in a range from 0.08 to 4 mmol/l, a concentration of Ca is in a range from 0.1 to 50 mmol/l, a concentration of Na is in a range from 5 to 1000 mmol/l, and a concentration of the buffer is in a range from 0.1 to 500 mmol/l; and

a pH of the protease reagent is in a range from 5.0 to 7.0.

30. (Previously presented) The measuring kit according to claim 23, wherein,

in the color-developing reagent, the second fructosyl amino acid oxidase is specific for a glycated α -amino group and a glycated side chain of an amino acid residue, the oxidoreductase is a peroxidase, and the color-developing substrate is N-(carboxymethylaminocarbonyl)-4,4'-bis(dimethylamino) diphenylamine sodium salt;

in the color-developing reagent, a concentration of the second fructosyl amino acid oxidase is in a range from 100 to 50,000 U/l, a concentration of the peroxidase is in a range from 0.1 to 400 KU/l, a concentration of the N-(carboxymethylaminocarbonyl)-4,4'-bis(dimethylamino)diphenylamine sodium salt is in a range from 0.02 to 2 mmol/l, and a concentration of the buffer is in a range from 10 to 500 mol/l; and

a pH of the color-developing reagent is in a range from 6 to 9.